

Profiling on Metabolites in Human Milk of Mothers with Self-Claimed Respiratory Allergy Using Nuclear Magnetic Resonance

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Structured Abstract

Background: Chronic inflammatory respiratory disease, asthma is typified by recurrent episodes of dyspnoea, coughing, and wheezing. Asthma impact 8% to 13% of pregnant women globally and its rate is merely climbing. In recent years, there has been a lot of discussion about the potential link between human milk and the development of allergy disorders. Metabolomics is a new approach that provides for a thorough understanding of the alterations in metabolites and the consequent signalling pathways. This study comprises the profiling metabolites in human milk based on maternal self-claimed respiratory allergy. The objective of this study is to profile the metabolites of human milk based on maternal respiratory allergy and to identify the difference between human metabolites of healthy mother (control group) and mothers with respiratory allergy (intervention group).

Methods: Five breastfeeding mothers with children aged 1- to 2-year-old were involved in this research. Each breastfeeding mother and infant that were involved in the research has met the inclusion criteria. Profiling on metabolites of the human milk samples using NMR spectroscopy was performed by Bruker Avance III 600 spectrometer operating at a ¹H frequency of 600.30 MHz. The software Bruker Topspin 4.0 was used to analyse the data and spectra of human milk samples obtained from the NMR spectroscopy.

Results: There are several metabolites hypothetically found only in human milk samples of mothers with respiratory allergy, and not in human milk sample of healthy mothers which consists of energy metabolites, amino acids, sugars, and fatty acids. All the metabolites found in the sample of human milk of self-claimed respiratory allergy exhibit differences compared to the human milk samples of healthy mothers.

Conclusion: In conclusion, it is remarkable that some of the metabolites from human milk samples of mothers with respiratory allergy differ from the human milk samples of healthy mothers. Mother's respiratory allergies may have an impact on the number of metabolites in the human milk. Nevertheless, human milk carries an abundance of great metabolites that benefits both the mother and the infant. It can be summed up that the metabolites could be varied between human milk of healthy mothers and human milk from mothers with respiratory allergy.

Keywords: Metabolites, human milk, respiratory allergy, NMR

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